issues are quiet, fundraising efforts of any import are likely to be fruitless[111].

B. Programming Obligations Are Unnecessary.

NAB and some commenters urge the Commission to impose requirements that ensure that DARS provides new services to rural listeners, minority and ethnic groups and others. It proposes that licensees be required to provide comprehensive program lists of the niche and ethnic programming they propose which will be periodically subject to public interest review.[112]

Public interest obligations are not necessary to ensure that DARS will provide differentiated and public oriented programming. First, the economic and distribution structure of DARS make it good business to offer programming that conventional broadcasters would not provide in the absence of regulatory incentives. Broadcast and satellite markets are fundamentally different. Broadcasters must offer programming that is relatively generic and will attract a mass audience. Satellite services can offer unique programming that attracts a mass audience by attracting small numbers of listeners from throughout the United States. Thus, DARS can, and will, offer full-time programming dedicated to kids (or Chinese or politics) not only because it is good for kids (it is), and not only because it serves the public interest (it does), but it also serves the bottom line. Thus,

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[111] "GlobalStar Offering Gets Cool Reception as Investors Balk at Mobilephone Plans," Wall Street Journal; "In New Space Race, Companies Are Seeking Dollars From Heaven," Wall Street Journal, October 9, 1995.

[112] This would be as difficult to administer as the advertising prohibition because DARS will offer time to others. To the extent that customer/programmers do not comply with program obligations neither DSBC nor the Commission has recourse. *In the Matter of Subscription Video*, 62 RR 2d 389 (1986).

DARS operators have sufficient market incentives to provide niche programming for audiences that receive limited or no service from existing broadcasters -- the "audio disenfranchised."

The proposed public interest obligations are not imposed on other multichannel service providers such as DBS and cable TV or other digital audio radio services. Nevertheless each provides the services that broadcasters would require DARS to provide.[113] It is important to note that these services did not develop until service providers had ample channel capacity and were deregulated.[114] Until that time generic programming was the norm. It is likely that *a similar result will appertain in DARS provided there is sufficient spectrum assigned to each licensee and regulatory flexibility regarding technical and service proposals.*[115]

Some broadcasters argue that programming obligations and ownership limits should be imposed on DARS because they are imposed on broadcasters. These obligations and restrictions are imposed *where the market fails, not simply to level the playing field.* DSBC does not disagree with additional flexibility for broadcasters, but it serves no discernible purpose to saddle the new DARS service with obligations merely because broadcasters face

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[113] In the video environment one can find long-form political debate on C-SPAN, continuous news on CNN, and programming aimed at kids on Nickelodeon. In the audio realm, multiple niche program services are offered including opera, environmental sounds, and comedy.

[114] C-SPAN's Comments point out that deregulation of the cable industry led to its creation.

[115] The only way that DARS licensees can hope to serve its audiences is through the grant of sufficient spectrum to provide a multichannel service with a wide variety of program options including niche services. Spectrum assignments of 12.5 MHz per licensee, at a minimum, will enable such a service. See Comments of DSBC. Less capacity, and fewer channels, will put DARS in the same position as broadcasters -- trying to attract as many listeners as possible through the use of generic fare.

such requirements. Moreover, no such restrictions are imposed on existing cable- or satellite-delivered digital audio services. If the Commission concludes at a later date that the market has failed, it can then proceed to regulate with the benefit of experience to direct its efforts.

C. Minimal And Flexible Technical Regulations Will Permit DARS Operators To Offer A Robust, State-Of-The-Art Service.

As a general matter, it is unnecessary for the Commission to impose technical requirements on DARS licensees beyond those absolutely necessary to ensure harmonious coexistence of competing DARS systems and users. Burdensome technical regulations may hinder DARS development, foreclose technical options or restrain the flexibility to respond to consumers needs and new technological developments.

NAB proposes a channel plan that assigns all 50 MHz in 5 MHz blocks and, it claims, can support up to 19 licensees utilizing only 5 MHz each. Cracker Barrel suggests that the Commission require that all applicants utilize CDM which, it maintains, will permit the licensing of up to 15 service providers sharing 7 satellites. Both of these spectrum plans are difficult to assess given the dearth of information filed. There is, however, sufficient information to conclude that neither plan is viable and the Commission may disregard them both.

NAB's proposed spectrum plan makes sense only if at least three or more 5 MHz blocks can be aggregated. Reducing spectrum from 12.5 MHz (as proposed by the applicants) to 10 MHz, or less, (as proposed by NAB) may require licensees to increase their satellite power in order to keep channel capacity at a viable level. DSBC's system engineers indicate that this is because the primary coding for the 10 MHz system is much less robust in correcting errors than that for a 12.5 MHz system and, therefore, the receiver would need

considerably more signal power to achieve the desired quality, in fact, according to DSBC's analysis, about 40% more power. Thus, reducing the assigned spectrum from 12.5 MHz to 10 MHz has two pernicious effects: 1) it increases the power flux density, creating coordination difficulty across the entire DARS band; and, 2) it substantially increases the cost of DARS satellites.[116]

Regarding Cracker Barrel's proposed CDM "system," DSBC is gratified that Cracker Barrel finds that the Code Division Multiplex technology proposed by DSBC in its application is well suited to the DARS mission.[117] However, based on the sketchy information filed by Cracker Barrel, DSBC is unable to verify that the specific claims made by Cracker Barrel regarding channel capacity and spectrum utilization would be feasible for realistic systems. Moreover, the Commission must recognize that these claims by Cracker Barrel are without support of any technical showing.

Cracker Barrel has not presented sufficient information for DSBC, the CDM proponent and *de facto* expert among DARS applicants, to completely analyze its proposed "spectrum plan." As a result, it would be difficult for the Commission to reach a conclusion on the advisability of its proposal. However, there is sufficient information to conclude that Cracker Barrel has a fundamental misunderstanding of the benefits of CDM. Although Cracker Barrel is correct about CDM being the state-of-the-art and the increased acceptance of CDM as a

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[116] This ignores the fact that a reduction in spectrum will also reduce the possibility of initiating an economically viable service.

[117] In fact, DSBC's request for a Pioneer's Preference is based in part on the fact that it developed a state-of-the-art CDM DARS system some three years before Cracker Barrel, and timely filed an application seeking to initiate its innovative system proposing initiation of DARS.

viable modulation technique, it is incorrect regarding the capacity effects of CDM. DSBC has proposed a CDM DARS system because it offers more flexible use of the spectrum in this mission than other modulation techniques.[118] For example, CDM permits DSBC to mitigate the negative effects of multipath and reduce certain objectionable interference. However, based on immutable data transfer limits, one modulation technique is no better than any other as to capacity.[119] Although Cracker Barrel has filed only sketchy data regarding its "system" the information filed and DSBC's analysis of CDM, and refinement of its CDM system over the past three years, lead to the conclusion that their assertions regarding capacity increases from CDM are flat wrong. Thus, the Commission should give little credence to Cracker Barrel's technical or service proposals.

Finally, Cracker Barrel's proposal that CDM be adopted as the DARS standard is unnecessary and improper. When it has been presented with multiple modulation proposals the Commission has correctly permitted the market to decide which is "best."[120] The Commission, however, has structured the spectrum band plan in order to facilitate all modulation proponents.[121] The Commission should approach DARS in the same manner, and

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[118] DSBC proposed two systems, CDM and TDM and has indicated it prefers the former.

[119] See DSBC Comments at note 46 indicating that system capacity is not appreciably different regardless of whether CDM or TDM is selected as the modulation scheme.

[120] Licensees for Personal Communications Services have the opportunity to select from a number of available digital standards, including GSM, CDMA and TDMA. The Commission has not interposed its judgement on the licensee's selection of the appropriate technology to serve consumers. PCS licensee will make their technology selection based upon their won assessment of the performance aspects of each standard. DARS licensees should have similar flexibility.

[121] *Id., see also, Big LEO.*

not favor a particular scheme.

In this regard, DSBC agrees in principle with the suggested modification of proposed Section 25.144(b)(2)(ii) requiring each satellite DARS operator to demonstrate that its system includes a receiver design that permits users to access all operational satellite DARS systems.[122] DSBC interprets this requirement to include DARS systems that employ differing modulation schemes. However, it may be prudent to delay this showing until a date after the applications are amended but before launch so that receiver designs can be finalized. As a practical matter, applicants can not know the design of competitor's systems during the application stage and, therefore, the required demonstration is not possible.

Ford Motor Company supports DARS, but is concerned that link margins be sufficient to permit service throughout the United States. It urges the Commission to require development of a nonproprietary open standard for DARS receiver systems and requested establishment of an Industry Advisory Committee to oversee the process. In fact, DSBC would be pleased to work directly with Ford, or any other manufacturers, to discuss mutually beneficial development and service issues. Thus, an advisory committee is unnecessary.

Terrestrial Gap-Fillers. NAB and all broadcasters oppose terrestrial gap-fillers because they resemble terrestrial radio service. NAB argues that "terrestrial spectrum" should not be used to enhance DARS service.

All DARS proponents favor gap fillers on the same frequencies, using the same bandwidth as the satellite and only in conjunction with an operating satellite. Contrary to NAB's claim, gap-fillers do not utilize spectrum other than that allocated exclusively to

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[122] 25.144(b)(2)(ii).

DARS. Nor do they extend the authorized DARS service area.[123] DSBC supports the proposed modifications to the Commission's proposed rules to account for terrestrial gap-fillers but suggests that Section 25.201 be modified to replace "involved" with "included."

DSBC urges the Commission to modify proposed Section 25.214(b)(3), frequency assignments, to permit licensees to select the frequency band they would like to employ at the time that it certifies it has met the first DARS milestone.

Proposed Section 25.414(b)(4) is rendered moot by DSBC's proposed telemetry tracking and control proposal outlined in its comments in this proceeding.[124]

V. CONCLUSION.

In DSBC's review of the case against DARS, it has found that broadcasters' economic harm conclusions are based strictly on the underlying assumptions they have chosen and, furthermore, that those assumptions are demonstrably false. If one is to believe broadcasters' conclusions about the public interest impact of DARS, and the results of their simulations and forecast harms, one must be prepared to believe that competitive impact on stations is synonymous with public interest impacts; that DARS will not create substantial new listening audiences; that DARS impacts will be realized immediately, thereby preventing broadcasters from mounting competitive responses; that there will be no growth in the radio business before DARS becomes a marketplace factor; that broadcasters will not adopt digital technologies; that the only possible reduction in station costs is from diluting the quality of

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[123] Broadcasters contend that DARS should not be permitted to do more than they can. However, broadcasters are permitted to use boosters to fill in coverage and translators to extend coverage.

[124] *See*, Comments of DSBC at 53.

the broadcast service by reducing programming; and, that broadcasters will find such program dilution to be their best market response. This is undeniably not the case, as DSBC, other DARS proponents and commenters in this docket have thoroughly and repeatedly demonstrated.

The time is long overdue for the Commission to act quickly to adopt comprehensive but flexible rules, as suggested in this proceeding, and immediately commence the processing of licensing the four pending applicants.

Respectfully Submitted,

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DIGITAL AUDIO RADIO: CRITIQUE OF ECONOMIC HARM STUDIES

Statement of
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Darby Associates
Washington, D.C.

To Accompany

Digital Satellite Broadcasting Corporation Reply

FCC Notice of Proposed Rulemaking
Establishment of Rules and Policies
for the Digital Audio Radio Satellite Service
in the 2310-2360 Frequency Band
Gen. Dkt. No. 90-357

October 13, 1995

Executive Summary

The Commission has spelled out in considerable depth and breadth its evidentiary requirements for broadcasters to meet their burden of proving the Commission has authority to override its statutory obligation to "encourage the provision of new technologies and services to the public."

In eleven paragraphs in the Notice of Proposed Rulemaking respecting digital audio radio services (DARS), the Commission requested extensive data and specified clearly how it should be organized and presented. The Commission also prescribed methods of analysis; it identified various components of the public's interest and guided respondents toward analysis of specific types of impacts; and, it otherwise spelled out a clear and consistent system of data, studies and analyses that DARS opponents must submit to meet their burden of persuading the Commission that the timely and unencumbered introduction of DARs is counter to the public interest.

This paper reviews the principal studies of an economic and financial nature filed by the radio industry; it analyzes the various models and analyses in the context of the Commission's directions; and, it evaluates the validity of forecast impacts and the overall probative value of the study results as measured by the Commission's definitions of the public interest.

DARS' opponents have failed the test. The package of economic and financial studies and analyses submitted by radio broadcasting interests in response to the Commission's solicitation neither complies with the clear admonitions and directions in the Notice, nor does it meet the statutory burden required for the Commission to delay any further granting DARS applicants the licenses required for timely and unencumbered opportunity to provide service to the public.

The core of the radio broadcasters' economic and financial case against DARS is contained in three attachments to its legal brief. While each of the other attachments is arguably relevant and contains some economic and financial content, the public interest argument against DARS prevails or fails on the basis of the strength of the analysis and force of the findings in these three attachments.

The NAB Economic Harm Arguments. The NAB economic harm analyses, arguments, methodologies and conclusions can be simply stated. Competition from DARS will lead to audience diversion, loss of station advertising revenue, reductions in cash flow and earnings, station financial distress and devastating effects on "community" programming, with especially disastrous effects on small market radio.

There is a common methodology in the formal models and "ad hoc" theorizing in the NAB case. The models are all strictly deterministic. The relationships specified, the assumed values for both exogenous and endogenous variables and the perturbations hypothesized are sufficient themselves to determine the predictions of harm. Thus, the analyses are completely driven by assumptions, and the results are unavoidable consequences of the structure of the models and their assumptions. The

common method is to commence by assuming, implicitly or explicitly, everything that is necessary to assure that the model generates economic harm. Thus, the validity of the analytical models, their predictions and relevance for weighing DARS impact on the public interest can be judged fully by evaluating the underlying assumptions. The principal assumptions analyzed in this paper are:

- **Broadcaster Assumption One -- DARS' economic impact on broadcasters equates to public interest impacts and no public benefits are created by new consumer choices;**

The Commission clearly stated that the impact on consumers, not the impact on broadcasters is at issue here. It would be ironic indeed if opponents of new competition and reliance on market forces are successful in convincing the Commission to use the number of consumers who choose to increase their welfare by purchasing new services as an index of harm to the public interest. Yet, that is exactly what opponents to new entry and increased market competition urge. However, the assumption is rendered false by the findings of NAB's own research. For every "minute of listening" diverted by DARS from traditional radio, nearly seven and a half new minutes are created "de novo" by DARS, according to an NAB survey.

- **Broadcaster Assumption Two -- Radio will lose 5%, 10% or 15% of its audience and revenues to DARS; all DARS listeners will be diverted from traditional radio;**

The NAB audience diversion assumptions are not verifiable from independent research and not even supported by the findings of an NAB sponsored Opinion Research survey. But, more importantly, the survey results call into serious question the assumption that relative audience loss equates to relative revenue loss. While the NAB asserts that the proportion of revenue losses for stations will be greater than the proportion of audience losses, there is no proof of this conclusion anywhere in the survey, or elsewhere in the record.

NAB reports that only 20% of respondents would listen to less radio if they had a CD quality alternative and that radio use would decline by 11.6% "overall". This confirms substantial loyalty to the radio medium and suggests that those who do switch to DARS will do so dramatically, thereby voting with their dollars to indicate their dissatisfaction with radio's current offering. Further, of those who will switch from traditional radio to a CD quality alternative, many will switch not to satellite DARS, but to terrestrial DARS, if they are given the opportunity by commercial broadcasters.

Many of the "switchers" will simply "add back" to the revenue streams of conventional broadcasters. Thus, a significant portion of any decline in traditional listenership will not represent either lost audience or lost revenue. Rather, it will

represent a switch from one radio station revenue stream to another. And, the more aggressive the local station is in converting to digital transmission and programming it in creative and competitive ways, the more of that revenue the industry can capture.

- **Broadcaster Assumption Three -- DARS' impacts will be realized immediately so that firms have no time to prepare or adapt;**

The broadcast models assume that DARS impacts taking five years, or ten years, or more to materialize will be realized in an economic, technological and market context characterized by yesterday's data. This assumed "time warp" belies the widely recognized existence of several time lags delaying the introduction and impact of DARS -- regulatory lags, implementation lags and market penetration lags. Different DARS diffusion paths have been suggested. The Commission need not determine the precise time required for DARS to reach any particular penetration level, but it cannot ignore the fact that considerable time will lapse before DARS will be able, even in theory, to have impacts described by opponents -- audience diversion, revenue loss, financial pressures, and program effects.

More importantly, it is imperative for the Commission to recognize that several intervening events are not only possible, but quite likely. And, that those events will influence substantially the ultimate impact of DARS on broadcasters. In fact these intervening influences may be sufficiently powerful to offset most of the negative effects predicted by opponents' mechanistic exercises.

- **Broadcaster Assumption Four --There is/will be no growth in the industry and no margin of safety provided by growing cash reserves;**

By assuming a "time warp" and projecting economic impacts onto the context of historical data, the models of DARS opponents suppose that future DARS impacts will be realized in yesterday's market environment and broadcaster financial context. Given the dramatic technological change and economic growth driving the industry's development, such an analytical process should not be accepted by the Commission. The use of data from 1993 or 1991 to provide context for analysis of uncertain DARS impacts likely to be realized a decade from now, and under enormously different technological and market circumstances, is assured to yield nonsensical results.

Public data that are widely relied on by financial analysts of the radio industry will support projections of "pro forma" cash flows suggesting that the radio broadcast industry will generate nearly $50 billion in cash over the next decade. That is roughly five times last year's total industry revenue and represents an enormous financial capacity to prepare for DARS competition.

How that $50 billion cash will be used is of course up to the managers and owners of the assets. It might be used to pay down debt; or be leveraged up to underwrite additional acquisitions; or to acquire or produce new programming, or to upgrade current facilities to permit digital transmissions; or to create new digital broadcasting revenue streams; or, in any of a variety of other ways. The point is that the industry will generate enormous amounts of discretionary cash in the next few years, and its use will influence the impact of DARS introduction in ways and magnitudes too important to simply ignore.

These pro forma cash flow projections also should help the Commission understand the basis for the feverish radio station license acquisition activity that has driven station values up so dramatically in recent years. Radio station investors are expressing their awareness of the growth of cash likely to be availed by ownership of these licenses by paying increasing multiples (of both revenue streams and cash flows) in radio license deals.

- **Broadcaster Assumption Five -- Broadcasters will mount no competitive response and develop no complementary revenues streams;**

It is simply not credible to suppose that the radio broadcaster industry will do nothing in the next ten years to prepare for and to confront DARS and other new entertainment technologies; or that it will not use its substantial, future "cash war chest" in ways to compete effectively with DARS and to protect its share of advertiser expenditures. Such an indifferent response would be a sharp, inexplicable departure from the industry's aggressive and adaptive record of past behavior. Alert managers in the industry are, without doubt, making plans now, as they have been doing for some years, to protect their markets from DARS; from cable radio; from digital audio competition from television broadcasters; from other radio broadcasters; and, from other competing technologies. Business strategists in well-managed radio companies will devise the means to compete aggressively in the digital audio market. Some will be more successful than others, but it is nonsense to suppose they will simply not try.

It is notable that the NAB's own survey reported that the average respondent would listen to 18.6 hours of digital radio per week, while diverting only a relatively small part (11.6%) of that from traditional radio. Thus, the digital audio market will create nearly 16.5 new hours of new radio listening -- or nearly eighty percent of the current market, reported by NAB to be 21.0 hours per week of listening. The Commission is being asked to believe that competent management, armed with substantial amounts of cash, will ignore the opportunities afforded by an eighty percent increase in current demand.

- **Broadcaster Assumption Six -- Cost reductions by station managers, other than in programming, are not possible.**

The "harm" models suppose that broadcasters will generally not respond to DARS, but when they do, they will do so by cutting back on the quality of the services they provide. It is not clear why they would do that, or in what measure, since program quality has been the industry's most effective tool in its successful adjustments to past technological and market changes. Since consumers do not pay directly for radio services, it is not possible for broadcasters to reduce directly the prices consumers pay. Thus, broadcasters' competitive tools in the end user market are more or less limited to improving program quality and diversity.

The burden of course is on broadcasters to show why cost reductions other than for programming are not feasible, or preferred as a competitive device. Only they have the data required to make such a showing. Thus, we are hardpressed to adduce detailed and conclusive factual cost information to refute the claims of broadcasters that there is simply no place in their operations to cut costs other than in ways that will diminish program diversity and quality.

But, the Commission should be skeptical. It should not simply accept broadcasters' assertions, without requiring the industry to supply recent data and to clarify the analysis supporting such claims. In view of the widespread cut-backs in all parts of the economy attributable to increasing "economic value-added", "business process reengineering", "downsizing", "rightsizing" and plain old "economizing", the Commission can reasonably insist on proof that radio broadcasters cannot become more efficient, if necessary, without cutting highly valued programming.

Our analysis of available data indicates, not surprisingly, that interest charges have grown dramatically as a percentage of revenue in recent years, thereby reflecting the cost of servicing debt added by the flurry of station acquisitions. These have been driven and financed by increasing leverage on station balance sheets. A simple comparison of the ratio of stations' interest expenses to total expenses for 1986 and 1990 indicates very substantial proportional increases. Thus, the ratio increased from 5% to 8%; from 3% to 5%; from 7% to 10%; and, from 5% to 9% for Daytime AM stations, Fulltime AM stations, AM/FM stations, and FM stations respectively.

These changes suggest that the debt service burden increased during the late eighties by more than 30% for all stations. And, this does not reflect any of the additional interest burden from debt-financed transactions after 1990. Again, the industry will generate substantial free cash flow in the next few years. Part of this cash flow could be used to reduce debt and strengthen balance sheets, thereby reducing the burden of interest charges and staving off the imperative, such as it might otherwise be, to cut program diversity and quality.

Further, according to scattered NAB data, General and Administrative expenses have in recent years been consistently twice as large (about forty percent of the total) as programming and production expenses (twenty percent), thereby at least suggesting the possibility that overhead might be cut substantially before diluting program quality and diversity and undercutting the stations' competitiveness in the marketplace by cutting back programming expenses. Our preliminary analysis of the data also refutes persistent claims by broadcaster proponents that stations have been responding to increasing competition in recent years by cutting back on programming expenses. To the contrary, the twenty percent share of total station expenses going to program and production activities has been uniform across stations and remarkably stable in recent years.

In short, broadcasters' claims that competition from DARS will force cut backs in valued program diversity and program options are not supported by any data or analysis submitted in this proceeding. And, our preliminary analysis of old NAB data indicates that significant reductions in nonprogramming expenses are possible, and quite likely to be explored by well-managed companies before even considering programming cutbacks.

Impact of DARS in Small Markets. Notwithstanding the persistent claims of NAB, there is nothing inherent in either the technology or the economics of radio to suggest that radio broadcasters face more difficulties than small community businesses in general, or that they are especially vulnerable to DARS. The scattered evidence adduced by NAB on the point is not persuasive and, indeed, supports very different propositions about the circumstances of small market radio. NAB's survey results indicate that diversion of radio listeners to DARS will be substantially greater in "Metro" areas than in "non-Metro" areas.

The NAB solicited an accounting firm to survey small market radio stations in an effort to support its claim of harm to small market stations from DARS. The responses offer little support. It is notable that eight of the seventeen markets surveyed, were excluded from the analysis, since they did not generate "sufficient responses" to permit analysis. In the context of the fact that three responses were apparently sufficient to permit analysis and inclusion in the sample, and in view of the likely bias in the remaining "self-selected" sample, the Commission should be suspicious about the representativeness of the sample and the results reported.

The accounting firm questionnaire apparently asked respondents to calculate the impact on net income of a 10% revenue reduction resulting, assumedly, from the "onset of new competitive media". We establish that the NAB has provided no basis for assuming that DARS will reduce either audience or revenue in rural areas by 10%. And, to the extent that audiences for traditional radio are reduced by DARS, it must be because consumers prefer it -- always, of course, a strong sign of improved

consumer welfare.

Further, as detailed in the paper, this type of "what if" simulation of the effect of hypothetical station revenue reductions presumed to follow from the introduction of DARS is based on an extensive array of highly improbable assumptions.

From the very selective information reported by NAB, it is impossible to verify important economic conditions in the markets or the firms being surveyed. Measures of accounting profits are suspect and subject to widely varying reliability. How much value is being taken above the line? How much value is attributable to trade-outs and barter and therefore not reported as revenue? What is the dynamic context of these "market snapshots"? Is the market growing? Is the number of stations increasing or decreasing? What is happening to formats? Are there persistent "winners" in the market? The NAB comments shed no light on such critical questions, to which answers are necessary if the Commission is reliably to assess DARS rural impacts.

The Commission noted that in the course of normal market-driven economic development some local broadcasters experience continuing losses. The small market survey results confirm this observation. Indeed, the accounting results, to the extent they reflect economic reality, paint a picture of a market in serious disequilibrium and one in which remedial forces are no doubt already in play. According the summary of the survey, 17 of the 35 responding operators report that they lost money in 1994. This is surprising in view of the overall health of the industry, and rural radio markets more generally, and suggests that some adjustments -- cost cutting, consolidation, management or format changes, or something else -- will be required to bring the market back into equilibrium. These normal market adjustments will of course occur well before the introduction of DARS.

Much of the evidence reported is an artifact of the general economic quandary of rural America. It may be that market forces will reduce the number of radio stations in small communities well before the introduction of DARS. Forces impelling consolidation in small communities of banking, schools, post offices, general retailing, automobile dealerships and even churches have been widely observed and analyzed. Small town radio is not independent of these larger economic forces and Commission action with respect to DARS cannot hold these communities and their radio stations secure from these larger forces.

The evidence presented here provides little assistance to the Commission's efforts to understand why, or what impact DARS might have in rural areas. The NAB conjectures are not the result of analysis, but are strictly determined by a single supposition and some elementary arithmetic. Thus, the NAB prediction of economic harm to small market radio, like its showing of harm to the public interest more generally, is the result of unsupported and unwarranted assumptions -- no more, no less.

I. Introduction

This paper reviews and critiques the principal economic studies, analyses and evidence submitted in response to the issues outlined and evidence solicited by the Commission in its Notice of Proposed Rulemaking in GEN Docket No. 90-357 -- Policy and Rules for Satellite Digital Audio Radio Services (DARS).

The analysis below focuses on evidence submitted by DARS opponents. The Commission made clear that the burden of proving adverse economic and public interest impacts from the introduction of satellite DARS is on incumbent broadcasters who have consistently alleged harmful effects. The Commission was both explicit and detailed in its solicitation of comments addressing the economic, financial and public interest impact of DARS in the market for audio services. The merits of the broadcasters' case can be evaluated only in that context.[1] The purpose of this review is to assess the adequacy of the economic and financial evidence submitted.

II. Summary of the Case against DARS

The argument presented by opponents of DARS can be summarized simply, as follows. DARS will divert audience from traditional radio, thereby reducing radio stations' revenues, cash flows and earnings. These effects will be so great that broadcasters will be forced to cut back on valuable "local" or "community" programs, while many marginal broadcasters, especially those serving small communities, will be forced out of business. These considerations exhaust the public interest in the matter, therefore DARS entry should be denied. Case opened; case closed!

Sherlock Holmes once solved a particularly vexing crime by noting that the dog did not bark. So it is here. The most compelling feature of the case filed by incumbent radio station interests is what it does not include. It neglects to address most of what was clearly solicited by the Commission. It does not include sufficient evidence to bear the burden of proving that DARS should be denied to the public.

The broadcasters' economic, financial and public interest brief is silent on most of the issues raised by the Commission. The brief focuses almost exclusively on supposed financial threats, notwithstanding the Commission's clear statement that, "The public interest...is the provision of services of value to the listening public and

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[1] The terms of the Commission's inquiry into the economic, financial and public interest impacts of DARS are spelled out in 10 paragraphs (Nos. 11-20) in the Notice of Proposed Rulemaking, *In the Matter of Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 Band*, FCC 95-229, Released June 15, 1995 [hereinafter DARS NPRM].

includes the protection of competition not competitors."[2]

The decidedly narrow focus of the brief is illustrated by the accompanying graphic, which summarizes the points of Commission concern and interest, while highlighting the principal areas in which the broadcasters respond and do not respond. The Commission was quite specific and expansive in spelling out the kinds of data, the methods of analyses and the sorts of impacts opponents of DARS would need to show in order to bear the substantial statutory burden of proof placed on them.

TABLE 1

FCC Inquiry and Broadcast Response

Impacts of Satellite DARS Entry

Areas of Potential Public Interest Impact	Incumbent Stations	Consumer Welfare
Audience	**Yes**	**Yes**/No
Revenue	**Yes**	No
Cost	No	NA
Cash Flow	**Yes**	NA
Total Earnings	**Yes**	NA
Profits from "local" programming	No	NA
Investment, Jobs	No	No
Program Diversity/Localism	**Yes**/No	**Yes**/No
Station Technology	No	No
Competitive Response	No	No
Timing of Impacts	No	No

[2] DARS NPRM, p.4.

As indicated by the Yes and No designations, broadcast interests were very selective in the kinds and areas of analysis and were by no means fully responsive to the request of the Commission for analyses in different areas of impact. Indeed, the broadcast response is focused on the potential impact of DARS on audience, revenue, profit and cash flow of incumbent broadcast stations, notwithstanding the Commission's clear admonition that it is the public's interest, not broadcast financial interests, that are of major concern here.

As indicated by the graphic, the broadcaster economic brief almost completely ignores the potential effects of DARS in offering consumers greater choice and diversity in programming. Moreover, the brief does not even respond fully to the Commission's inquiry about the effects on broadcasters. It is silent on key issues such as investment, jobs, profits from local programming, the possibility that DARS will stimulate the production of local programming, the effects on new technology adoption (for both entrants and incumbents), broadcasters' competitive responses (except for unsupported assumptions that "local" programming will be diminished) and the fact that DARS is unlikely to be a significant factor in the market for at least a decade.

The broadcasters' brief focuses almost exclusively on "hypothesized" diversions of audience and assumed impacts therefrom on revenue and cash flow, and further assumed influences on broadcast station viability and programming choices. While certainly interesting and instructive, such mechanical, algebraic exercises neither illuminate nor incorporate the real economic processes that drive the industry. Indeed, the analyses assume that there will be no change in the market behavior of incumbent firms as a result of the introduction of DARS.

The impact of DARS will be realized over time in a dynamic marketplace in which incumbent broadcasters will be, as they have been in the past, tenacious and resourceful competitors. Their competitive reactions to DARS will certainly have an important influence on the course of events in the marketplace. It is not believable, as assumed throughout by the broadcasters' economic brief, that stations will react passively to competition from DARS.

The remainder of this paper addresses the principal economic, financial and analytical comments in this context. It critiques the principal economic and financial analyses submitted; and, it brings to bear alternative assumptions about the environment within which DARS impacts will be realized. Based on our analysis and modification of the economic and financial models presented NAB, we conclude that the assumptions of the broadcast models substantially and predictably pervert their results and that more realistic, empirically verifiable assumptions indicate clearly that the potential harm to broadcasters and local programming is grossly exaggerated.

In our review of the case against DARS, we have found, and will discuss below, that broadcasters' economic harm conclusions are based strictly on the underlying assumptions they have chosen and, furthermore, that those assumptions are demonstrably false. If we are to believe broadcasters' conclusions about the public interest impact of DARS, and the results of their simulations and forecast harms, we must be prepared first to believe that competitive impact on stations is synonymous with public interest impacts; that DARS will not create substantial new listening audiences; that DARS impacts will be realized immediately, thereby preventing broadcasters from mounting competitive responses; that there will be no growth in the radio business before DARS becomes a marketplace factor; that broadcasters will not adopt digital technologies; that the only possible reduction in station costs is from diluting the quality of the broadcast service by reducing programming; and, that broadcasters will find such program dilution to be their best market response.

III. The NAB Economic Harm Arguments

The NAB brief has several attachments. These address a variety of matters -- some economically relevant, some not. The case against DARS is that it will cause economic harm and financial distress to broadcasters and lead to diminution of "local" or "community" programming. The core of the case is found in two attachments, with important data about DARS listening and audience diversion drawn from a third.

- Attachment 9 -- "The Economic Impact of Satellite-Delivered Radio on Local Radio", prepared by Kagan Media Appraisals, Inc. (KMA or Kagan), provides the models that purport to measure economic harm by station size and market size;

- Attachment 14 -- "Miller, Kaplan, Arase & Co. Report", prepared by an accounting firm of the same name which addresses the effect of DARS on stations in small markets;

- Attachment 5 -- "Estimating the Audience Diversion from Broadcast Radio by the Introduction of Satellite Digital Audio Radio Service (DARS)", prepared by the Research and Planning Department of the NAB and reporting the results of a survey undertaken at NAB direction by the Opinion Research Corporation.

The NAB case is straightforward and simple. It involves spelling out what NAB calls the "Syllogism of Economic Impact and Reduction in Local Service" -- audience diversion, loss of advertising, loss of revenue and profit and "devastating" effects on

local service.[3] Further, economic losses and adverse impacts on local programming will be particularly severe for "small market local radio".[4] We will discuss this case below, as it is set forth in the three studies.

III. The Kagan Models

The principal analytical support for the NAB Economic Harm arguments is provided by Kagan Media Appraisals, Inc. Since this is the main basis for much of the NAB claim of harm to the public interest from DARS, we will review the KMA models in detail.

III. A Overview of KMA Models.

The KMA Study has humble objectives, rather less in scope than the Commission had requested in its solicitation of policy models. KMA summarizes its analysis as follows:

> "The following report focuses on the potential economic effects on local radio of new satellite-delivered radio services by analyzing the likely impact of both subscription-based and advertiser-supported satellite-delivered audio radio as to:
>
> > Audience fragmentation
> > Revenues lost"[5]

The KMA Study commences with good, summary descriptions of the announced intentions and hopes of the four satellite DARS applicants and the basic economics of radio. Taken together, they credibly determine that the introduction of satellite DARS is likely to have an impact on incumbent radio audiences and revenues from advertiser support that should not be ignored.[6]

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[3] Comments of the National Association of Broadcasters, September 15, 1995, filed: *In the Matter of Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 Band*, FCC 95-229, Released June 15, 1995, pp. 24-30 [Hereinafter, NAB Brief].

[4] NAB Brief, p. 33.

[5] The Economic Impact of Satellite-Delivered Radio on Local Radio, Kagan Media Appraisals, Inc.; Attachment 9 to Comments of the National Association of Broadcasters, September 15, 1995, filed: *In the Matter of Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 Band*, FCC 95-229, Released June 15, 1995, [Hereinafter, KMA or Kagan], p.1.

[6] Kagan, pp. 4-9.

KMA correctly points out that DARS will not be instantaneously and universally adopted in the marketplace, even though they do not reflect that important fact in their subsequent analyses. Consumer adoption of the technology will take time. While there is no good reason to doubt the likely success of DARS over the long run, it is doubtful that over 26 % of U.S. households (over 13% if households average two subs each) will subscribe to a satellite digital audio service within 5 years after initial introduction, even though that might be an accurate summation of various company announcements.[7] As pointed out by KMA, these diffusion patterns must occur even though there are no compatible receivers now being manufactured.

Kagan's explanation of the basic economics of radio emphasizes and correctly characterizes the relationship between audience and station advertising revenues. They generally move in the same direction, since advertisers are buying access to potential customers (listening audiences) from stations.[8] KMA does not specifically and directly address the structure and determinants of station costs. Cost is assumed to be a constant, arbitrary percentage of revenue. KMA estimates stations' costs by assuming a "cash flow margin":

> "In general, the higher a station is rated, the more revenue it generates, and the more cash flow it generates. Typically, a top rated station will cash flow [sic] 33% of its revenue base...Typically, cash flow margins for mid-rated stations might run 20%. A low rated station, however,

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[7] The facts from past consumer electronics equipment and services innovation indicate that 26%, or even 13%, household penetration within five years following introduction is "off the chart". See, Larry F. Darby, "Economic Potential of Advanced Television Products", Report for the U.S. National Telecommunications and Information Administration (Department of Commerce, Washington, DC), 1988, discussion around p. 33. For a fuller discussion of the importance of consumer electronic equipment diffusion in the context of DARS, see Economic and Financial Aspects of U.S. Commercial Radio Broadcasting, Larry F. Darby, Darby Associates -- Washington, D.C., September 15, 1995. Attached to Comments of Digital Satellite Broadcasting Corporation filed: *In the Matter of Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 Band.* (Hereinafter, "Darby Radio Analysis")

[8] Kagan, p. 10. According to Kagan, "Radio is a business dependent on delivering audiences to advertisers." A station is "rated" for purposes of establishing advertising rates by its share of the market and its "power ratio" -- a ratio that reflects the relationship of a station's share of revenue in the market to its share of the market's total audience. A "power ratio" of, say, 1.4, according to Kagan, indicates that a station's revenue share is 1.4 times its audience share. A power ratio of less than 1.0 indicates a station whose revenue share is less than its audience share. Higher rated stations generate more revenue per listener and, therefore, tend to be financially stronger. These relationships are important in the context of broadcaster claims in other contexts that revenue is proportional to audience, and that revenue losses can be predicted directly from audience loss. The Kagan explanation makes clear that such a connection simply does not exist.

> might generate only 10% cash flow margins. And...many low rated stations suffer negative cash flow."[9]

KMA asserts that expenses unrelated to sales are in the nature of "fixed operating costs" that tend to remain at about the same level, "unless a station begins to cut costs by laying off personnel and cutting programming services."[10] (Emphasis added) Furthermore: "As in all businesses with fixed operating costs, there is only a certain amount of expense cutting that can be achieved."[11]

KMA reckons the economic impact of DARS in terms of the "fragmentation" of existing radio audiences and simulates such effects from three different perspectives:

> > Fragmentation effects by station size
> > Fragmentation effects by market size
> > Loss of national revenues

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[9] Kagan, p. 10. Kagan's view that many low-rated stations now suffer negative cash flow is notable, since it indicates very serious disequilibrium in some small radio markets, inasmuch as small stations were reported by Kagan to enjoy average cash flow margins in 1994 of 17%, and to have averaged cash flow margins of 11% over the entire period 1984-1994. The cash flow history of stations, as reported by Paul Kagan in other publications, is summarized and discussed in our initial comments in this proceeding ["Darby Radio Analysis", at pp. 11-13] and stands in sharp contrast to Kagan's characterization here. We have no way of knowing what the frequency distribution of cash flows in small community stations is. We can surmise, however, if it is reasonably close to a normal distribution and has a mean cash flow margin in the neighborhood of 17%, that the probability is small of having a large number of stations with negative cash flows. Moreover, such stations will have adapted to current market realities, or gone out of business, well before DARS can be a factor. Our impression is that losses among small market radio stations have been reported for years, yet on balance the business seems to be thriving. (A more complete discussion of small community radio appears in Section IV below.)

[10] Kagan, p. 10.

[11] Kagan, p. 10. We are convinced that Kagan is correct about the high degree of operating leverage in the business. But, we hasten to point out that such leverage has symmetric effects. It is painful when revenues decline, for such leverage implies difficulty in ratcheting down costs in the short run. But, leverage works on the upside as well. When revenue grows, as it has been growing, and is expected to continue to grow in the future (See "Darby Radio Analysis", Table 1, page 3), operating leverage throws cash from revenue growth right to the bottom line. And, unless expenses are grown proportionally, cash flow margins will increase with revenue growth. That fact is recorded by Paul Kagan Associates data that show cash flow margins growing, between 1990 and 1994, from 31% to 37% for large stations; from 19% to 30% for medium stations; and from 7% to 17% for small stations. (See Table 5 of my earlier paper and the references cited there.) This growth in cash flow, and the expectations that it will continue, is reflected in the growing valuations and acquisition premia being paid for station licenses. The average cash flow multiple being paid for radio station licenses has increased from 7.4 X to 10.3 X since 1991, the year of the industry's nadir. (See "Darby Radio Analysis", `Table 6 and accompanying text and references.)

KMA concludes that:

> "...at a minimum satellite delivered radio could cut in half the cash flow of average large and medium markets, ranked 1-136. In average small market stations 137-200, satellite radio could take all station cash flow. The impact of such economic effects on local radio could be devastating..."[12]

We will examine in detail the basis for this conclusion and, more particularly, we will critique each of these "fragmentation" analyses individually. But, it is helpful first to spell out the common methodological approach underlying the analysis and conclusions derived from each of the three "fragmentation" models.

III. B The KMA Study Methodology

The KMA Study is neither an economic analysis, nor a financial analysis, in the sense usually recognized by economists and financial analysts. That is, there are no behavioral or theoretical relationships among key variables specified or tested. Economic actors do not respond to changed circumstances, or at least their responses are not described so that they can be validated. Economic incentives, reaction patterns and market processes more generally are not incorporated into the models, nor even recognized as potentially important. Rather, the models focus on comparing results from one assumed state of the market to the results in another assumed state of the market, and all without regard to collateral or temporal changes.

The models used by KMA are "simulation" models of sorts, inasmuch as they use a system of hypothesized relationships and assumed values for key variables.[13]

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[12] Kagan, p. 1.

[13] "Simulation" is a process of representing one system by another. Simulation models extract key relationships, parameters and estimates from real world processes and configure those in ways that permit calculating the effects on the dependent variables of selected, well-defined perturbations of the underlying key causative variables or processes (i.e., the relationships between the key variables). Computer simulations represent real world systems or subsystems as a system of equations that can be solved for various specifications of the model's variables and functional relationships quickly by computer. Thus, for example, the growth of income or population or disease in the real world is often simulated by complex mathematical growth models. Many macroeconomic forecasts are the result of large, computer simulation models and account in part for the profession's forecasting reputation.

The assumed relationships and variables essentially drive the model in a strictly "deterministic" way. The results of the model follow exactly, strictly and without variation from the hypothesized relationships, the assumed values of key variables and the disturbance factors (the assumed perturbations of the model). The validity of the models' predictions can be tested directly by validating the assumptions.[14]

III. C Assumptions of The KMA Models

We have identified six key assumptions of the Kagan models and in view of the central place they play in the Kagan analysis, we discuss them in some detail below. The most important of these assumptions are:

- DARS' economic impact on broadcasters equates to public interest impacts and no public benefits are created by new consumer choices;
- Radio will lose 5%, 10% or 15% of its audience and revenues to DARS and all DARS listeners will be diverted from traditional radio;
- DARS' impacts will be realized immediately so that firms have no time to prepare or adapt;
- There is will be no growth in the industry and thus no increasing margin of safety;
- Broadcasters will mount no competitive response and develop no complementary revenues streams; and, finally
- Cost reductions by station managers, other than in programming, are not possible.

[14] These "deterministic" models are frequently contrasted with so-called "Monte Carlo" simulations that are based not on assumed values of key variables and disturbances, but on probability functions that reflect the fact that different processes, variables and disturbing events are possible and subject to varying probabilities. The KMA models are strictly deterministic. That is, the results of exercising these models are the ineluctable consequence of the models' assumptions. The computer scientists' shorthand description of the link between the assumptions and the results of computer models is GIGO -- "garbage in, garbage out".